trä!

A MAGAZINE ON INSPIRING ARCHITECTURE
FROM SWEDISH WOOD » ISSUE 2 » 2024

TREE TRUNKS SHAPE DESIGN

Exposed frame in round landmark

SWEDISH WOOD AWARD 2024
- GREATER FOCUS ON THE PUBLIC

FLEXIBLE HALL
WITH UNIQUE LIGHT

DIVIDED SPACES
IN HOME WITH HEIGHT

TRÄ MEETS
Parisa Liljestrand

KNOWLEDGE
Blue-stained wood risks being discarded unnecessarily

trä!

ISSUE 1 » 2024
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Emil Nordin

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Award gives a boost for public buildings

In the end, Sara Kulturhus took home the Swedish Wood Award 2024. The building stands as a model of technological innovation and challenge, with architecture that confirms Skellefteå's commitment to green industry. However, competition was fierce, among a trend for many public buildings being nominated.

SWEDISH WOOD

Swedish Wood disseminates knowledge about wood, wood products and wood in construction, contributing towards a sustainable society and a thriving sawmill industry. We achieve this by inspiring, educating and driving technical advances.

Swedish Wood represents the Swedish sawmill industry and is part of the Swedish Forest Industries Federation. Swedish Wood represents the Swedish glulam, CLT and packaging industries, and collaborates closely with Swedish builders' merchants and wholesalers of wood products.

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Editorial

Anna Ryberg Ågren Director, Swedish Wood

Value the climate benefit of the forest industry

ONSALA, SWEDEN Early summer is finally here, with light evenings, singing birds and budding greenery. But it is not just nature that is boasting green shoots. The Riksbank's long-awaited cut to the key interest rate gives hope of a boost to housing construction. This is reflected in optimism about the future among Sweden's sawmills. Over the past year, the industry has struggled with profitability due to rising costs, but hopefully we are now seeing a much-needed shift.

On the other hand, the Swedish National Board of Housing, Building and Planning's proposal for limits on the climate impact of buildings, which has been out for consultation this spring, does not inspire hope about housebuilding. It is a step in the right direction, not least because the construction and real estate sector is responsible for a large part of Sweden's total greenhouse gas emissions. Many, including myself, think that introducing limit values is a good idea. But unfortunately, the proposal is insufficient to drive progress towards a lower carbon footprint. It is already possible to build in both wood and concrete with a lower climate impact than the proposed limit values for 2025. The proposal will thus be an empty exercise and not at all the political action needed to force change on construction projects with a high climate impact.

We need political action not just in Sweden, but also in the EU, to meet the climate challenge and give hope to future generations. The European Parliament elections are coming up, and a new Commission will then be appointed. The goal is for the EU to be climate-neutral by 2050, which requires a policy that values the total climate benefit from the forest industry – in terms of both the growing forest and the products made from forest raw materials that are able to replace fossil materials. A recent study on substitution potential and climate impact in the EU forest value chain, conducted by AFRY on behalf of the Wallenberg Foundations' holding company FAM, shows that increasing the substitution of fossil materials with fibre-based raw materials is crucial to reducing EU emissions. The study finds that the greatest climate benefits are achieved by replacing fossil-dependent building materials with wooden buildings and substituting plastic packaging with fibre-based packaging materials.

Read the Swedish Forest Industries Federation's election survey to find out more about the issues that some of Sweden's European Parliament candidates want to pursue over the next term.

Anna Ryberg Ågren

w| skogsindustrierna.se/eu-val-2024/
w| bit.ly/fam_skog (Afry's report)

Adolf Bereuter

High ceilings, warm materials and plentiful light turn ordinary playrooms into creative studios at the preschool.

Creative studios for children

OBJECT Preschool
ARCHITECT Bernardo Bader
STRUCTURAL ENGINEER Holzelementbau

EGG, AUSTRIA A new preschool will help to draw people into the village, partly through its central location and partly through its design. A line of six volumes with pitched roofs provides the carcass of the preschool, within which the interior is structured like its own little village. The corridor serves as the main street into each room, where the four groups of children each have a room at their disposal. The remaining two volumes house communal areas, such as the kitchen and dining room, and offer a natural meeting place like a village square. With thoughtful lighting and ceiling heights of up to six metres, the rooms have the feel of creative, independent studios rather than ordinary playrooms, an impression that is reinforced by the soft, warm wood on the walls, the waxed floors and the abundance of light.

Externally, the building has a generous courtyard for easy drop-off and pick-up, while the connection to nature is present in the adjacent green fields and babbling brook.«

W| bernardobader.com

Fjord-side recreation

OBJECT Sauna
ARCHITECT Oslo works

NESODDEN, NORWAY A place for wellness, contemplation and closeness to nature, coupled with sociable community. This was the idea behind the sauna placed on a rocky shoreline a short ferry ride from Oslo, with views of the sea and the city and front row seats to watch the sunrise. The seemingly floating wooden structure sits on four slender steel piles and is built using timber modules. The solid wood is clad externally with oiled, charred heartwood pine shingles, whose shades of grey allow the building to blend in with the open landscape.

The sauna cabin consists of two parts: a communal sauna and a changing area. Between these, a narrow passage leads to a ladder down into the water. The sauna is made from modules that are easily transported, in a design that can also be expanded to add both a roof terrace and a shower – if you're not tempted by the ice-cold dip.«

W| oslo.works

Marte Garmann

The sauna was made in modules and can be set up almost anywhere there is water. The shingle façade readily blends into the environment.

Gregor Graf

The ceiling, with its repeated pattern in glulam, lends the room a warm feel. The beams extend out into the exterior on the southern side.

Abandoned building with new top floor is now communal living for the elderly

OBJECT Retirement home
ARCHITECT Moser und Hager
STRUCTURAL ENGINEER ZTW Weilhartner

HAURUCK, AUSTRIA A 1950s building needed modernising before it could open as a retirement home, and in its new guise the wishlist included an open design with panoramic views of the Alpine landscape. The brief also sought to preserve much of what was already there, so parts of the original building were left in place.

The lift and staircase have been renovated and adapted to give residents easy access the upper floor, which is now the heart of the building with space for private rooms. The previous pitched roof has been replaced with 700-millimetre glulam beams that extend across the entire ceiling in an exposed grid, with diagonal beams providing extra support and an added design feature.

Above the grid, skylights also let more light into the room. The beams extend the roofline on the south side, projecting almost four metres to form a sheltered outdoor space that can be used for much of the year.«

W| moserundhager.at

Paul Wennerholm

Wooden turbine towers have several advantages over steel, including a lower environmental impact and easier transportation and assembly (as pictured).

Lofty heights for wooden turbine towers

OBJECT Turbine towers
ARCHITECT Modvion
STRUCTURAL ENGINEER Modvion

SKARA, SWEDEN In March, the blades began turning on the world's first full-scale wooden wind turbine tower, standing 105 metres tall. The tower is made of laminated veneer lumber (LVL), which provides a hugely strong structure thanks to the direction of the wood grain. The taller a tower is, the more electricity can be produced because the wind blows more, higher up in the air.

However, as wind turbines get taller, transporting them becomes a major challenge as they also become larger in diameter. Unlike steel towers, wooden towers are delivered in quarter-circle modules that are assembled into pipe sections on site and then craned into place. The tower will also be lighter, making it possible to go tall at a lower cost.

In addition, producing traditional steel towers has a high environmental impact, but this is greatly reduced with wooden towers, which also store large amounts of absorbed carbon. The ambition is for the tower to be dismantled into its constituent parts and reused in other forms in the construction industry once its operational lifespan is over.«

W| modvion.com

Flexible factory symbol of sustainability

ARDENNES, FRANCE The Hermès fashion house started out producing leather products for horses and riders, including saddles. Today, it is best known for its bags and scarves. The majority of its production is based in France, where they recently needed to modernise one of their factories.

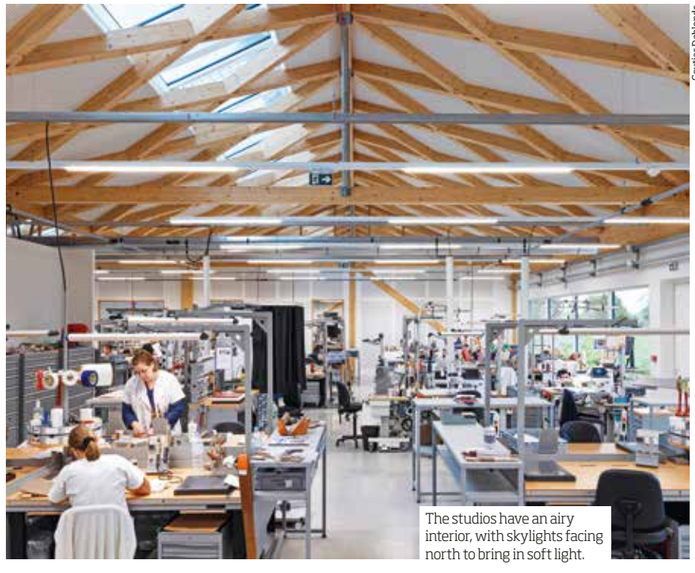
The primary structure uses Douglas fir, sourced locally. Behind the charred façades of the exterior, the open interior boasts a light-coloured glulam post-and-beam frame that extends into an exposed grid-shell ceiling, providing a pleasing contrast with the polished concrete floor and, above all, highlighting the company's sustainability message. The skilled workers are welcomed into an environment designed to encourage dialogue and promote concentration, with the skylights directed north in the pitched roof to provide good working light while protecting against excessive sun.

The 5,700 square metre building contains four leather workshops that can be adjusted in the future due to the flexibility of the grid structure.«

OBJECT Factory
ARCHITECT Coldefy
STRUCTURAL ENGINEER VP Green

W| coldefy.fr

Gautier Deblonde



The studios have an airy interior, with skylights facing north to bring in soft light.

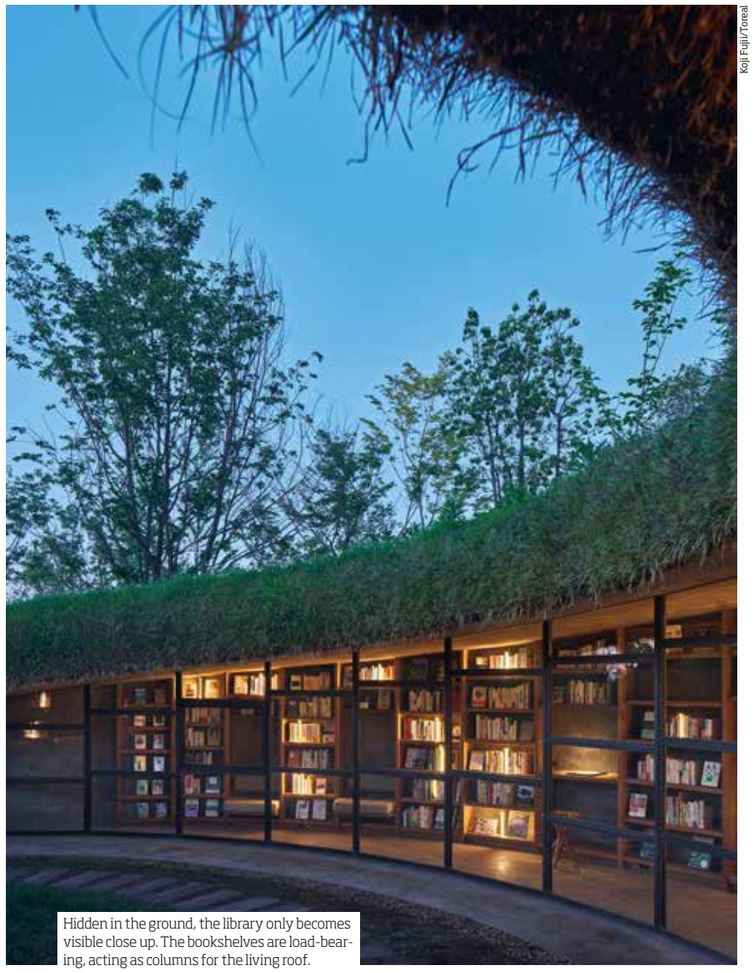
Library underground with plants above

KISARZU, JAPAN Plough the fields on sunny days and read books when it rains. That was the idea behind the library created in the corner of a field and run by an agricultural company. In this case, the architects wanted the building to be located under the plants in the soil, based on the idea that the earth is the source of all life. The library has therefore been tucked into a small cleft and fully adapted to its surroundings, with vegetation on the roof making the building difficult to spot from a distance.

OBJECT Library in the earth
ARCHITECT Hiroshi Nakamura & NAP
STRUCTURAL ENGINEER Kanebako

The ceiling height in the interior varies according to the slope of the ground, and there are hidden rooms so small that only children can crawl into them. At the far end is a reading room, which is also used as a function space. The circular room is framed by bookshelves within 40-millimetre-thick glulam frames, in a structure where each beam supports the next. The slender vertical beams are bent and bonded together and meet at the top in an opening, an elegant solution that gives the structure additional support.«

W| nakam.info/en



Koji Fujii/Toreal

Hidden in the ground, the library only becomes visible close up. The bookshelves are load-bearing, acting as columns for the living roof.

Thibaut Voisin

The pavilion offers views of the vines and landscape. From here, you can also follow the vineyard's wine production up close.

Elevated table in landscape for food and wine enthusiasts

EL CORTIJO, SPAIN Let the welcoming red carpet gently lead you into a pavilion set amidst the vines, with countryside views stretching to the distant Cantabrian mountains. This is the idea behind a volume offering visitors wine tasting with a ringside seat to follow the workings of the vineyard.

The exposed structure consists of glulam columns, combined with cross braces, all with dimensions of 100×75 millimetres. The overlying »balloon frame« is clad with 40 wooden panels that enclose the 30 square metre space. Of these, 33 can be reused, as they have not been significantly cut or modified. Red metal frames lining the window openings give visitors the illusion of the landscape as a painting, while the activity in the space can be clearly seen from the outside. The pavilion is designed to be an elevated table that allows visitors to taste and smell both the surroundings and a good Rioja wine.«

OBJECT Elevated table in landscape
ARCHITECT J-AF architecture, González Serrano studio+
CARPENTERS Prosma, Montajes de Pedro

W| arquitecturajaf.com
gonzalezserranostudio.com

Stephan Werk

High ceilings, movable walls and a welcoming interior allow the hall to be used for both sports and culture.

Symmetrical roof in vertical geometry

RADOLFZELL, GERMANY Forget the smell of old gym clothes and the feeling of cramped spaces. More and more sports halls are embracing wood, and the new multi-purpose hall on the northern shore of Lake Constance is a prime example. The focus here is very much on the material, with striking façades clad in a rhythmic pattern of slender vertical battens that protects athletes and spectators from bright sunlight and irritating glare. The building is capped with a protective cantilevered roof, supported by glulam beams, which runs around the entire building. Behind the four glazed entrances the generous foyer, with its walls and ceiling of exposed wood, opens up to give visitors a full view of the upper level's grid-shell structure and its clear connection to the exterior.

Flexible inner walls in one of the halls mean that the hall can be used for both sports activities and cultural events. The south side can also be fully opened up to connect with the adjacent sports field in summer.«

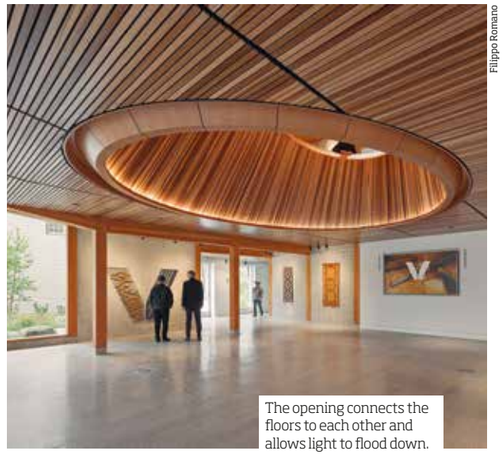
OBJECT Multi-purpose hall
ARCHITECT Steimle architekten
STRUCTURAL ENGINEER VT-Architektur Konstanz

W| steimle-architekten.com

Museum of Norwegian folk art

DECORAH, USA Vesterheim Norwegian-American Museum has recently expanded to include a new cultural campus featuring folk art exhibition spaces. The building also provides a visual link between the museum's heritage park and the town's main street.

The entrance hall stands out with its distinctive roofline, supported by glulam columns and beams, and an underside clad in battens of different shades. The interior is an extension of the entrance hall, with the same kind of wood and design, but most notable is the welcoming lobby, where an elegant, circular opening in CLT lets light cascade down from the upper floor. Its interior is clad with the same thin laths found in several other parts of the flexible interior, combining with the light to create a vibrant and lively design.



Filippo Romano

The opening connects the floors to each other and allows light to flood down.

Alongside the wooden structure, the building is constructed using locally sourced brick and tactile concrete walls. The design is a way of showcasing both local and Norwegian craft traditions and their associated materials.«

OBJECT Museum
ARCHITECT Snøhetta

W| snohetta.com

Chronicles

Håkan Widjedal, architect SAR/MSA, arkitektstudio Widjedal Racki

The importance of a good example

TROSA, SWEDEN In 2000, Natasha Racki and I won the Swedish Wood Award. We were young students at KTH in Stockholm, at the age when you know exactly what is wrong with all buildings and how they should be done instead. As a degree project, we had spent a year out in the forest designing and building a holiday home for some neighbours – a workshop where we did everything ourselves. The Swedish Wood Award and a wave of publicity led to new enquiries and we opened our first small office.

That was 24 years ago. »DIY« has been replaced by teamwork, and the critical eye has been replaced by wonder that some projects get built at all. How did they manage to sell their vision and get it funded? How did they get to the finish line without compromising, pivoting and throwing in the towel? I now know how hard it is. It usually takes a lot of persistence, courage and confidence, but also an understanding of the added value that comes from going all the way to the finish line. For example, how many of us would know much about the city of Bilbao if Frank Gehry's museum had been compromised, ending up expensive but merely mediocre? How many ripples would never have spread?

Architects know and grapple with this on a daily basis, and many possess the above qualities in abundance. But why then do so relatively few projects actually make it all the way when the skills are there? Of course, everyone involved needs to share the vision. Nothing is good without good teamwork, but the most important person is the client – because if no one asks for excellence, nothing excellent will be built. That is why I really like the fact that the Swedish Wood Award is shared between the architect and the client (editor's note: now also the contractor and the structural engineer).

But how do we raise the ambitions of our clients? We work mostly with private individuals who often spend endless time on Pinterest and similar media. Their inspiration usually comes from abroad, because it is only when you see something you really want to achieve that you can start asking for it! A good example is crucial, which is why I welcome all the TV programmes about architecture that are gaining in popularity. Especially when they emphasise the importance of teamwork and the efforts of architects. Programmes that hint that a building can be so much more than a floor plan in a catalogue and can contain so many other, much greater qualities! Populist programmes that don't belong in architecture's inner sanctum? Maybe, but this is where the chain starts. I am hoping for an awakening that sparks more clients to seek that extra something, and along the way I applaud any good example that manages to get built!

This is an opinion piece. The views expressed are the writer's own.

CIRCULAR OPENING SHAPES LIGHT AND DISTRIBUTES LOADS

PHOTOGRAPHER
Jin Weiqi
OBJECT
Rehmannia Root Crafts Exhibition Hall
ARCHITECT
Luo Studio
STRUCTURAL ENGINEER
Henan Shancheng

XIUWU, CHINA The root of the Rehmannia plant is commonly used in herbal medicine, in a tradition that dates a long way back through history. The preparation process consists of 18 steps, so when a herbalist wanted to add an exhibition hall to their workshop, it felt only natural to design the building as an 18-sided, almost round polygon.

The space consists of a circle arranged around a central pillared frame, creating spaces both inside and outside the structure. The inner ring is marked by a sunken stage with integral seating. Instead of standard windows, light enters along the eaves and through gaps between the walls, but mainly from the central oculus which has a diameter of 2.5 metres. The roof structure spans 37 metres, with glulam beams connected in a circular formation. The beams support and overlap each other in a spiral, distributing the loads and creating a curved effect in the space, despite their straight lines.«

- The houses in the village tend to have masonry walls made of locally produced red brick. The exhibition hall uses bricks in both the façade and the interior walls, for which local craftsmen have used traditional bricklaying techniques.
- At its base, the glulam frame features shelves of different heights. These are used to display products, while the walls provide space for display boards and information.

w| luostudio.cn

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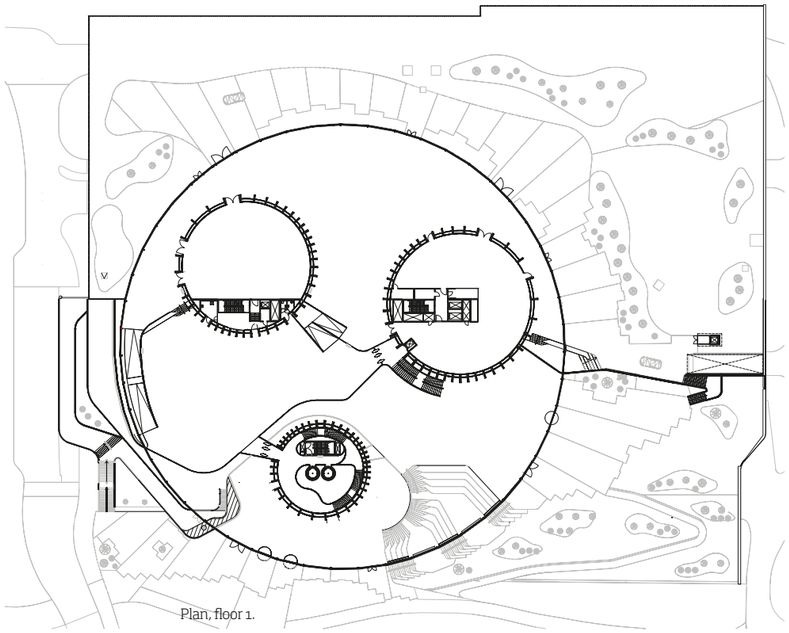
UNIQUE LANDMARK HITS NEW HEIGHTS

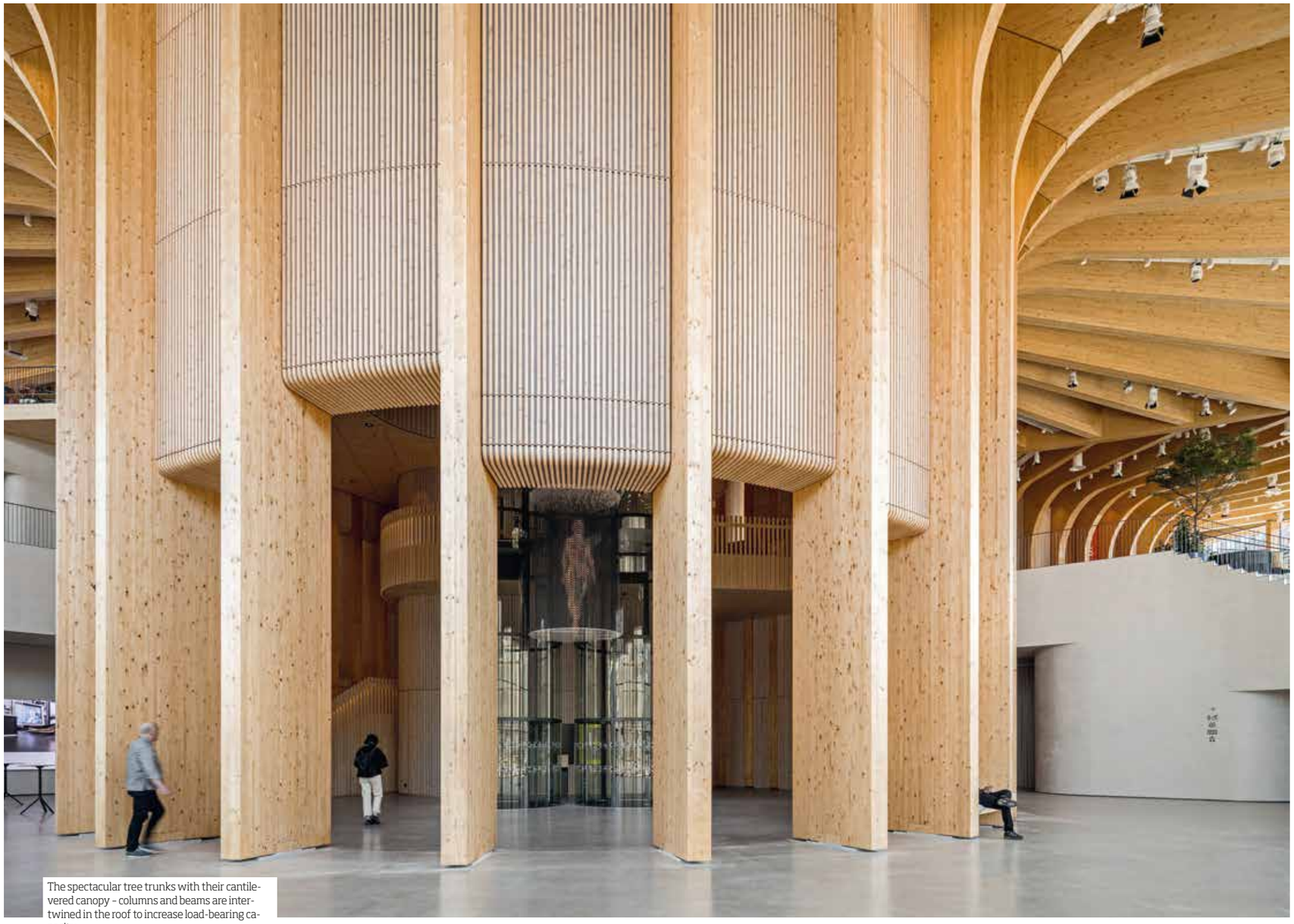
The spectacular wooden World of Volvo building in Gothenburg serves as a showroom, meeting place and event arena all in one. With its rounded form and unique timber structure – clearly visible through the glass façade – it has quickly become a popular landmark. »

TEXT Sara Bergqvist PHOTO Rasmus Hjorthøj

The inviting entrance features high ceilings and glazed façades that showcase the advanced structure.



Plan, floor 1.



The spectacular tree trunks with their cantilevered canopy – columns and beams are intertwined in the roof to increase load-bearing capacity.

When the architects at Henning Larsen presented their vision for the new World of Volvo to their clients, they hardly dared hope for a positive response. The idea was bolder than usual – to build an extremely complex wooden structure over several winding floors, designed as three tree trunks topped by a giant cantilevered tree canopy, with a park and pavilion on top, and this in the middle of central Gothenburg.

»Some people probably thought we were utterly mad, but there were several others who totally got it. When I drove home to Copenhagen after the meeting, I was very happy and excited, thinking yes, they really are brave enough,« says Martin Stenberg Ringnér, lead architect and associate design director at the Danish architectural firm Henning Larsen.

The first things that strike you as you walk through the entrance to the World of Volvo are the immense ceiling height, the warm feel and the scent of wood. Despite the large number of people in the vast, airy spaces, the sound level is pleasantly subdued.

»Having all this wood in the building helps to create calm, harmony and a good indoor climate – the more wood, the better. The working environment during the construction process is also much better because wood is so much quieter to work with and doesn't generate dust in the same way as concrete,« says Thomas Thompson, project manager for World of Volvo.

The project began with the Volvo Group and Volvo Cars needing new premises for their joint museum, which prompted the idea of doing something more than just a museum, creating a meeting place and an experience centre for customers and visitors from all over the world. It was also deemed important to place the building in a central location in the city, next to Liseberg Amusement Park and Oceana Water World.

»The Volvo companies are hugely important for Gothenburg, but visitors see barely a trace of that, because all the activities are located in Hisingen, a good distance from the city centre. But with World of Volvo, we've created a new tourist destination right in the heart of Gothenburg's events district,« says Thomas Thompson.

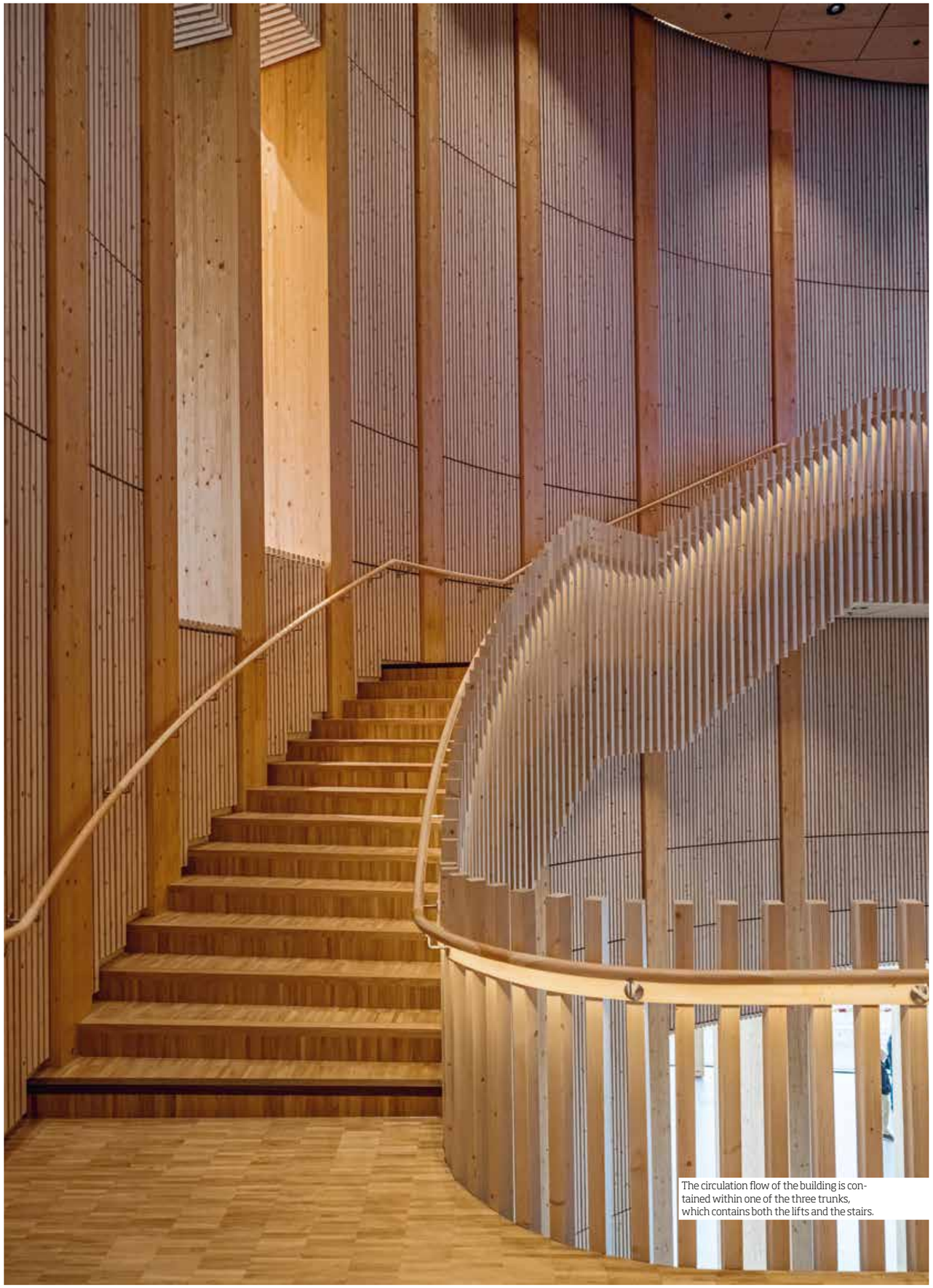
The new building includes several exhibition halls, conference facilities, a concert and events stage for audiences of up to 1,000, and award-winning chef Stefan Karlsson's Ceno restaurant. Large vehicles can drive straight into the building on the ground floor – or go all the way up to the exhibition areas on the third floor with the help of a giant vehicle lift that can accommodate 15-metre vehicles and handle weights of up to 22 tons. The exhibition halls themselves can take heavier vehicles, but they need to be lifted up by crane. There is also an indoor bus stop for electric buses at street level.

»The plan is to be able to get straight into the building without getting wet if it rains. There are currently no scheduled buses that stop here, but we're in talks with Västtrafik about that right now,« says Thomas Thompson.

THE UNIQUE ARCHITECTURE and structure are inspired by nature, the forest and the Right of Public Access – as also reflected in the fact that, with the exception of the exhibitions, much of the building is accessible to the public free of charge. These sources of inspiration also made wood an obvious choice of material. The three tree trunks that make up much of the supporting structure represent the tree of knowledge, and are crowned by the green sedum roof canopy. The concrete foundation, firmly anchored with over 1,000 piles through the clay to the bedrock below, is the outcrop on which the trees are growing. But the solution is not only symbolic – it is also functional.

»The whole building has a diameter of 90 metres from glass façade to glass façade. If you draw a perfect triangle inside that circle, each tree trunk is at the midpoint of each side of the triangle. Positioning them in this way made it possible to vary their size. Working out from the tree trunks, we were able to weave together columns and beams into a roof structure that allowed us to avoid more columns. This has given us large, cohesive exhibition areas and made it possible for heavy vehicles to drive in and out of the building,« says Martin Stenberg Ringnér.

Two of the tree trunks also accommodate a different type of exhibition space from the rest of the building, as they have no natural light and can therefore easily be lit and controlled »



The circulation flow of the building is contained within one of the three trunks, which contains both the lifts and the stairs.

The building houses conference rooms and exhibition halls, with the top floor serving up panoramic views.

» in different ways. The third trunk is the circulation area for the entire building, with lifts and stairs from the car park in the basement.

The original plan was for the car park, which belongs to Liseberg and the City of Gothenburg, would be located next to the new building.

»But an eight-storey car park next door wouldn't have been a good look. So the architects suggested we excavate space for part of the car park and put World of Volvo on top of it instead. This way we were also able to achieve a unified parkland environment, where the building with its green roofs and outdoor environments becomes a great bridge between Mölndalsån, the river that flows past below, and the tree-lined park up on the hill on the other side of the motorway. When you look out over the sedum roof on the fifth floor, you don't even see the motorway below. It feels as if there's nothing between you and the trees on the other side,« says Thomas Thompson.

Apart from the ground floor, the entire load-bearing structure is made of glulam and cross-laminated timber (CLT) in spruce, bound together with steel fixings and metre-long wood screws. The glulam was produced and processed by Austrian timber engineering company Wiehag, while all the CLT comes from Stora Enso's Gruvön sawmill. The largest glulam spans in the roof measure 34 metres, which posed certain logistical challenges.

Architect **Martin Stenberg Ringnér**

»WORKING OUT FROM THE TREE TRUNKS, WE WERE ABLE TO WEAVE TOGETHER COLUMNS AND BEAMS.«

»To transport the glulam beams – all of which were unique – we needed to use a Volvo truck with a remote-controlled rear axle. We also had to make the bridge over Mölndalsån a little flatter so they could get over it,« explains Thomas.

The design used both parametric tools and 3D models, employing two structural engineers and two CAD technicians at Wiehag full-time for two years.

»There's probably only us and a couple of other companies in the world capable of designing such a complex building. »

At the top of the World of Volvo, the view has competition from the rounded trunks of the structure.

» We've done both larger wooden buildings that are less complex and small wooden buildings that are more complex. Here we have a combination of size and complexity, which makes this building entirely unique,« says Johannes Rebhahn, who heads Wiehag's international projects.

IN ADDITION TO the unusual design, there were a number of other parameters and requirements to consider. One was designing for the exceptionally high loads from the sedum roof and the pavilion at the top. Another was the proximity to the motorway and the potential risk if, for example, a truck there was to catch fire and explode.

»The part of the building facing the motorway uses reinforced glass and is designed for extra heavy loads. Little did we know that the greatest danger would come from the other side,« says Johannes Rebhahn, referring to the fire that broke out in nearby Oceana Water World earlier this year, which exploded into flames.

»We were lucky that the fire didn't reach this far. And even though the building doesn't have extra reinforcement in that direction, it's still incredibly robust,« adds Johannes.

World of Volvo
GOTHENBURG, SWEDEN

ARCHITECT Henning Larsen.
CLIENT Volvo Group and Volvo Cars (Göteborgs stad parkerings AB is the client for the car park, designed by Fredblads Arkitekter)
STRUCTURAL ENGINEER Wiehag
COST Approx. SEK 100 million
AREA (LOA) 22,000 sqm
CERTIFICATIONS WELL Gold and LEED Gold.
w| henninglarsen.com

Wiehag, where he works, celebrated its 175th anniversary last autumn and has a long history of working with large-span wooden buildings. In Austria, for example, they constructed a wooden building with a span of 100 metres back in 1966.

»We're now seeing a greater focus on building in wood at height. So the World of Volvo is particularly exciting, as it challenges technology in all areas and in all directions,« he concludes.

Swedish Wood Award points the way forward

One of the country's most prestigious architectural prizes has been awarded by Swedish Wood, and this year's winner was Sara Kulturhus in Skellefteå. But the award is also a reflection of modern architecture and a way to show just what can be achieved with wood. »

TEXT Katarina Brandt PHOTO Emil Nordin

Sara Kulturhus
WINNER SWEDISH WOOD AWARD 2024

ARCHITECT White Arkitekter.
CLIENT Skellefteå Municipality.
STRUCTURAL ENGINEER DIFK, TK Botnia.
CONTRACTOR HENT Sweden.
W| whitearkitekter.com

Cederhusen
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT General Architecture.
CLIENT Folkhem trä.
STRUCTURAL ENGINEER BTB, Bjerking, Limträteknik.
CONTRACTOR Veidekke, Byggpartner.
W| generalarchitecture.se

Höghult
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Fabel Arkitektur.
CLIENT Private.
STRUCTURAL ENGINEER K-märkt Byggnadsvård.
CONTRACTOR K-märkt Byggnadsvård.
W| fabelarkitektur.se

Villa Meltem
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT M.arkitektur.
CLIENT Meltem Duzakin.
STRUCTURAL ENGINEER Algeba Byggkonsulter.
CONTRACTOR Öjns Bygg.
W| m-arkitektur.se

As the focus on sustainability increases, so does the interest in wood construction and thus also in the prestigious Swedish Wood Award, which was established back in 1967. The award is presented every four years to acknowledge and reward good architecture in wood and to reflect and advance contemporary architecture in Sweden.

The Swedish Wood Award 2024 took a different approach from previous iterations. This time around, all the jury work – from internal discussions and site visits to the final selection where 145 submissions were whittled down to 12 nominees – could be followed in a TV series format on YouTube.

The idea was born when Swedish Wood had to cancel the planned Wood Award Gala in 2020 because of the pandemic. Instead, a digital format was developed, with an award ceremony broadcast live on YouTube.

»We had over 1,000 viewers and the initiative was so successful that we jokingly said next time we'll do it all on TV. Once that seed was sown, the Swedish Wood Award underwent its biggest overhaul ever. Instead of just announcing the results, this time we let the viewers follow the whole process, which many people found very interesting,« says Alexander Nyberg, architect and head of the Swedish Wood Award at Swedish Wood.

The jury work for the award is based on a meticulously planned logistical process that includes travelling around Sweden to visit a selection of the submitted projects and nominating eight to twelve of them. The 2024 Wood Award jury consisted of architect Rahel Belatchew, architecture critic, author and journalist Mark Isitt, designer and architect Thomas Sandell, and architect Camilla Schlyter. In a new development this year, the jury also had the help of an advisory expert in the form of Björn Johanson, who works as a structural engineer at Bjerking and is a specialist in wooden structures. His role was to support the jury in validating the technical performance of the competing buildings.

»Of course, the architect has a prominent and vital role in the creation of new projects. But the role of the structural engineer has increased, especially in collaboration with the architect. These days, we're almost always involved at an early stage, supporting the architect and the client or developer. With Sara Kulturhus, for example, it is quite apparent that the structural engineer played a crucial role,« says Björn Johanson.

THE SWEDISH WOOD Award is an exciting journey through Swedish architecture and design in wood, with many great examples of wood's potential as a material. Rahel Belatchew, who chaired the jury, says the high number of public buildings among the entries for the Wood Award 2024 reflects a changing industry.

»In the past, the Swedish Wood Award was dominated by private homes, with public buildings being in short supply. I can definitely see a change there, and one that I think will become even more evident in the future. In many ways, wood construction is what Swedish architecture does best. »

Kullabergs Vingård
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Berglund Arkitekter.
CLIENT Arildtuvan.
STRUCTURAL ENGINEER Åkermans Ingenjörsbyrå, Limträteknik.
CONTRACTOR Henrik Andersson Byggnads.
W| berglundarkitekter.se

Twelve Houses
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Förstberg Ling.
CLIENT Förstberg Ling.
STRUCTURAL ENGINEER Structor, Kvarteret K, Woodcon.
CONTRACTOR Förstberg Ling.
W| forstbergling.com

Outdoor Office
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Anders Berensson Architects.
CLIENT Fiskartorpet.
STRUCTURAL ENGINEER Cowi.
CONTRACTOR Allt i Bygge.
W| andersberenssonarchitects.com

Kilströmskaj
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Wingårdh Arkitektkontor.
CLIENT Brf Lilla Holm.
STRUCTURAL ENGINEER Fristad bygg, Looström Konstruktionsbyrå.
CONTRACTOR JSB Construction.
W| wingardhs.se

» And the fact that it's just getting better and better and advancing at a rapid pace has been very exciting to see.«

The jury has noted nostalgic nods to traditional methods, alongside a trend for projects based on industrialised processes with their high precision. These are two tracks that have more in common than you might think – ultimately it is about craftsmanship and how to work with wood to create architecture.

Sofie Campanello and Catharina Dahl Palmér have run Fabel Arkitektur in Gothenburg since 2012. They are the architects behind the Höghult holiday home in Karlsborg, one of the projects shortlisted for the Swedish Wood Award 2024. Höghult was recognised for its architectural excellence, which paired traditional building techniques with simplicity and modernism. In addition to the Wood Award, the project has also been nominated for the Kasper Sahlin Award and the Young Swedish Architecture prize.

Rahel Belatchew and Mark Isitt during their visit to Villa Meltem.

Svenskt Trä

»Working on Höghult, we drew inspiration from history and used traditional timber building methods as a starting point. The log and post construction is based on old techniques that only work for wood. Being nominated for the Swedish Wood Prize put us in the mix with several different types of buildings. And there we were, a small player out on our own,« says Sofie Campanello.

WITH ITS 20 FLOORS and ground-breaking design, this year's winner, Sara Kulturhus, is not only one of the tallest wooden buildings in the world – it has also set a new standard for wood construction and sustainable architecture. The Wood Award jury describe it as the building to bring the community together and a building that signals Skellefteå's desire to be at the forefront of wood construction, not just in Sweden but globally.

»There are many dimensions to Sara Kulturhus. It's a tall building and in that sense it's a technical innovation that challenges what's possible. And wood is used very consistently and visibly, so you really get a sense of the material,« says Rahel Belatchew. »

Nodi
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT White Arkitekter.
CLIENT Next Step group.
STRUCTURAL ENGINEER BRA Teknik.
CONTRACTOR BRA Bygg.
W| whitearkitekter.com

Library House
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Fria folket.
CLIENT Staffan Michelson.
STRUCTURAL ENGINEER Hanna Michelson, BT Kon, AFRY.
CONTRACTOR AJ Hälsinge Renovering & Bygg.
W| friafolket.se

Medicinareberget
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Wahlström & Steijner Arkitekter.
CLIENT Akademiska Hus.
STRUCTURAL ENGINEER Cowi, Wahlström & Steijner.
CONTRACTOR Skanska.
W| wahlstrom-steijner.se

Kunskapshuset
NOMINEE SWEDISH WOOD AWARD 2024

ARCHITECT Liljewall, MAF Arkitektkontor.
CLIENT Gällivare Municipality.
STRUCTURAL ENGINEER WSP Byggprojektering.
CONTRACTOR Nåiden Bygg.
W| liljewall.se

» The jury found it interesting to see how Skellefteå has used architecture to demonstrate the shift towards green industry within the city and the wider region. Sara Kulturhus stands as a symbol for the future of sustainable construction, and has attracted considerable attention both in other parts of Sweden and internationally.

»It's also interesting that the municipality is the client. I'd like to see more of our public clients actually leading the way in sustainable construction and good architecture,« says Rahel.

Robert Schmitz and Oskar Norelius at White Arkitekter were the lead architects for Sara Kulturhus, and they are both proud and pleased to have received this award – a win that they believe validates their commitment to pushing the boundaries of what can be built with wood.

»We're driven by a desire to work with wood and make the elements visible so that you can read the building. The consistent use of materials and what that has done for the experience are also highlighted in the jury's citation. The fact that the Swedish Wood Award has been around for such a long time and is presented relatively rarely puts Sara Kulturhus in an exclusive group. The projects become a reference for Swedish wood construction and part of our architectural canon,« says Oskar Norelius.

White Arkitekter also designed the Nodi office building in the Hovås district outside Gothenburg, another nominee for the Swedish Wood Award 2024. It is a statement building with a clear silhouette that is distinguished by the fact that it gets bigger and bigger with each floor.

A little closer to central Gothenburg, Medicinareberget has a district cooling centre unlike any other. The brief from the client, Akademiska Hus, included two requirements: that the building should be unique and carbon neutral. And both these wishes were met by choosing wood. The structure consists of glulam arches that are joined and stabilised at the top by a steel ring. Between the arches sit layers of spaced boarding, vapour control membrane, mineral wool, fibreboard, plywood and battens. The façade is clad in pine shingles treated with a tar paint known as Roslagen mahogany.

»Utility and community service buildings that are healthy and sustainable in all respects are a trend that I see coming. The fact that this small but important utility building had a shot at the Swedish Wood Award is proof positive that we have succeeded in creating something unique in wooden architecture and wood construction technology,« says Jürgen Wahlström, the lead architect for the district cooling centre at Wahlström & Steijner Arkitekter.

THE NEW APPROACH adopted for the Swedish Wood Award 2024 increased its reach and has received a great deal of positive feedback. Alexander Nyberg therefore wouldn't be surprised if the Wood Award continues to be based on a video format in the future.

»Right now, we're focusing on evaluating the results so that we can make the best decision for the Swedish Wood Award going forward.«

Find out more and watch all episodes at trapriset.se

Meet the architects **Robert Schmitz & Oskar Norelius**

»We have a constant dialogue with each other«

Work on Sara Kulturhus began nine years ago, making it a project that the architects in charge, Robert Schmitz and Oskar Norelius, have essentially »grown up« with.

Sven Burman/Visit Skellefteå

Oskar Norelius and Robert Schmitz, from White Arkitekter, were the lead architects for the winner of the Swedish Wood Award 2024, Sara Kulturhus.

IT TOOK a hefty dose of perseverance to hold on to and defend the concept all the way to completion – a journey that they describe as tough and rewarding, with the dream of winning the Swedish Wood Award always on the horizon.

»We had to be much more involved in the work on Sara Kulturhus than on other projects, because no one has done anything like this before. The same is true for the structural engineers and the other consultants who were committed to the idea and keen to implement the vision,« says Oskar Norelius.

Robert Schmitz and Oskar Norelius say that having two lead architects has been beneficial, not least when it came to bouncing ideas around, but also strengthening the arguments. The major innovation in the work on Sara Kulturhus was to think in terms of wood from the outset and incorporate the properties of the material.

»We're good at talking and have a constant dialogue with each other. Such an exchange was hugely important in a long process like this. The work involved broad and deep collaboration across all the disciplines, which worked extremely well because everyone involved was aware of the project's potential and challenges,« comments Robert Schmitz.

When it comes to the future of wood construction, they are both optimistic. They see a trend whereby more and more architects and builders are embracing wood for its aesthetic qualities and environmental benefits. The Swedish Wood Award is an important source of inspiration in this context, as a barometer for developments and an advocate for wood as a construction material.

»Winning the Swedish Wood Award is of course a great honour. In the past, the type of building that received it was fairly limited. This year the field was different because the nominees represented so many different categories,« says Oskar Norelius.

Ett förband bortom gränsen

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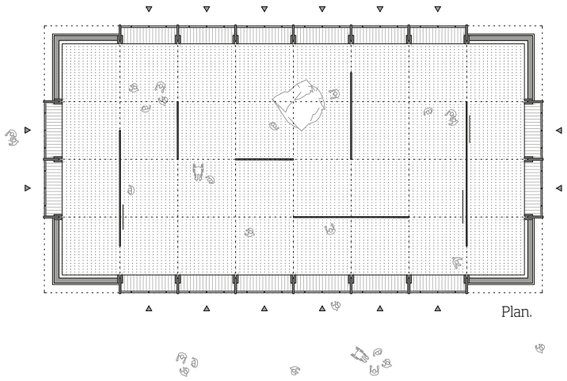


Plan.

A CHANGING SPACE WITH A FLEXIBLE STRUCTURE AND INNOVATIVE LIGHTING FOR ARTISTIC CREATIVITY AND SOCIAL INTERACTION

TEXT Johan Bentzel **PHOTO** Nicolas Wefers

Kassel School of Art and Design has a long and winding history that dates back to 1777. Today, thousands of students come here to study visual arts, visual communication, product design, art education, art history and aesthetics.

The school describes itself as a place of constant change, where artistic and creative freedom is combined with scientific thinking. The students are encouraged to break conventions and explore new paths.

Somehow all this is manifested in the 450 square metre exhibition hall that opened in 2022, in the courtyard of the art school's listed north building.

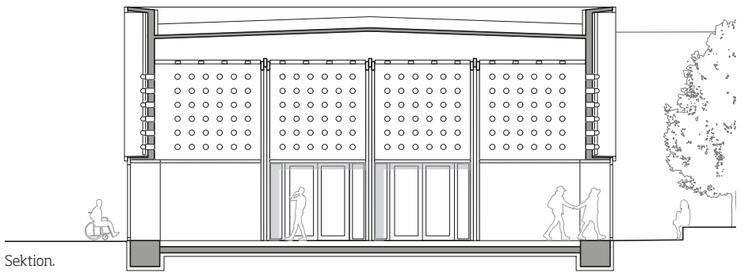
The latter was designed by architect Paul Friedrich Posenenske and built in the 1960s, and now its concrete and steel structure stands in contrast with the dark wooden façade of the new building. The buildings clearly represent different aesthetic ideals and eras. And yet they interact well with each other.

The exhibition hall looks like an elegant box, sitting regally in the courtyard, its rough-sawn larch an intense black, creating a simple but tasteful design. While it stands out and draws the eye, it also blends in and interacts well with its surroundings.

Markus Innauer from the Austrian architectural firm Innauer Matt, which won the architectural competition to design the exhibition hall, says that the façade colour is inspired by the black steel structure that surrounds the historic 1960s building.

»When I first came to view the site, I was so impressed by the existing building. It has a very clear structure, a kind of raw and direct materialisation, and I was attracted by the atmosphere that it invoked. We wanted to carry that same feeling over to our building. So we created something different, but still in harmony with the rest of the site.«

Using wood was a natural choice. According to Markus Innauer, the building felt predestined for this material, and it was also the best solution in both financial and environmental terms. Glulam was used for the cylindrical components, such as columns, beams and transoms. Cross-laminated »



Sektion.

Architect **Markus Innauer**

»A WOODEN EXHIBITION HALL IS NOT THE MOST OBVIOUS SOLUTION.«

» timber (CLT) was used for flat components such as roof formwork and wall panels, and all the joints for the timber structure were handcrafted.

»We didn't want to use concrete or steel like in the old building. Times have changed since that was built. We wanted to create a modern building and it felt exciting to be building a wooden exhibition hall, as it's not the most obvious solution,« says Markus Innauer.

The rectangular exhibition hall is positioned concentrically in relation to the older building, i.e. with a common centre, creating a generous front plaza.

KASSEL IS THE HOME of Documenta, one of the world's largest recurring exhibitions of modern art, and this is reflected in a small green space with seven so-called Beuys trees. For Documenta 7 in the 1980s, artist Joseph Beuys had 7,000 oak trees planted in the town as a kind of permanent and living work of art.

The internal structure of the exhibition hall, with its clear line of sight through the entire building, is, like the black façade, a clear reference to Posenenske's 1960s building. Similarly, the untreated wooden surfaces of the interior allude to the rough concrete surfaces of the older building. The hall opens up in all directions and invites visitors in like a warm embrace, enveloping them in fragrant firs.

»It's like stepping into another world. We left the wood unpainted to create a direct relationship with the material. It's an inspiring environment for the art students to work in,« says Markus.

Innauer Matt has a well-documented ability to create simple architectural solutions in complex conditions, seamlessly blending the new with what already exists.

With limited space in the courtyard and a tight schedule to avoid disrupting the school's activities, the best solution for the exhibition hall was to use as many prefabricated elements as possible, enabling the hall to be erected quickly.

The brief included creating not just an exhibition hall, but a flexible space for multiple uses. The building is also used for lectures, concerts and sound installations, for which the beautifully warm acoustics provided by the wood are a great benefit.

The hall can be used in its entirety or divided into sections using 36 movable pine wall elements that run along rails in the ceiling. When not in use, the wall elements, which are 5.8 metres tall and 1.15 metres wide, can be pushed away into one corner of the room.

»You can move the walls around however you want. We weren't quite sure that the students would use this feature, but every now and then I get sent pictures showing the new exhibitions, and the walls are always being used in new and different ways. That feels good, because we didn't really know how it would turn out. Sometimes your ideas work great and sometimes things don't turn out the way you intended, but in this case it »

The hall is wedged into the courtyard of the listed building in the north part of the campus. Despite their differences, the buildings interact well with each other.

The glass lenses in the upper walls not only create a pleasant light inside the exhibition hall, but also form a graphic feature on the façade.

» worked exactly as we wanted,« says Markus.

A particularly distinctive feature is the 864 curved glass lenses in the upper walls, which have both a practical and an aesthetic function. Markus Innauer himself is very pleased with the solution, which he says gives the exhibition hall a graphic depth when sunlight and shadows hit the façade.

»We thought a lot about how to bring in light. We didn't want direct sunlight. We wanted a softer light that was suitable for an exhibition or as lighting for a working artist. Our first idea was to bring the light in through the ceiling somehow, but then we thought of trying to do something with the walls instead, to perforate them in some way. We felt this could not only have an internal function, but also add something to the outside, to make the façade more special.«

Before proposing the glass lenses, Innauer Matt consulted designers about what was even possible and also created a detailed cross-section to give a general outline. After winning the architectural competition, they continued to pursue their idea.

They tested different forms of mouth-blown glass and produced four variants. They then made prototypes with holes in the walls to explore the functionality and appearance on both the outside and the inside, including how the light fell at different angles. The result was a triple glazing solution with a sandblasted glass on the inside to soften the light in the desired way.

»It was a fascinating process and certainly a lot of work, but now we have a special effect for both the interior and exterior, which was our intention from the beginning. We weren't sure what to expect, but it has worked out really well. It was great to see what we were capable of creating and that we could achieve something like this,« says Markus Innauer.

The design of the light lenses was the biggest challenge. Otherwise, the project was not particularly complicated in terms of structural engineering. The intention was to create a basically simple wooden building using solutions that were not too complex. As a result, the exhibition hall doesn't contain all that much technology. There is no ventilation system, for example; instead, the space is naturally ventilated through the windows in the roof and walls.

»It was important for us not to have too advanced a level of technology in the building, but to take a low-tech approach instead.«

Exhibition hall

KASSEL, GERMANY

ARCHITECT Innauer Matt architekten.
CLIENT University of Kassel
STRUCTURAL ENGINEER Günter Meusburger
COST SEK 42 million
AREA (LOA) 450 sqm
ENERGY DEMAND 43 kWh/sqm
W| innauer-matt.com

It is possible to either divide the exhibition hall into sections or use the room in its full size.

The hall can be opened up in all directions and envelops visitors in fir that promotes an inspiring environment.

Parisa Liljestrand Minister for Culture

»GETTING INVOLVED IN YOUR LIVING ENVIRONMENT IS A QUESTION OF DEMOCRACY«

How does wood contribute to Swedish heritage and culture inform the architect – and can we physically build democracy? These are some of the questions that Trä put to Minister for Culture Parisa Liljestrand, who presented the Swedish Wood Prize 2024 to the winner.

TEXT David Valldeby PHOTO Ninni Andersson/Regeringskansliet

What does having an architecture prize for wooden buildings do for Sweden?
– I believe in the importance of showcasing good examples, and in terms of wooden architecture, showing how it can relate to the history of the place, to the cultural landscape and to building traditions. A prize like the Swedish Wood Award inspires people and highlights all the special qualities and opportunities inherent in wood construction. It was an honour to present this important award, and it was a very special feeling to do so in the Wisdome at Tekniska Museet in Stockholm, which is an architectural masterpiece. There were many incredible nominees, but we have a worthy winner in Sara Kulturhus, which I was lucky enough to visit earlier this year.

How do you see wood in the context of Swedish cultural heritage?
– Sweden has a long tradition of wood construction, with our forest heritage forming a key element of our overall cultural heritage. In recent years, innovative companies, architects, forestry companies and municipalities have pushed for an increase in the construction of timber buildings, and with such a wide range of applications, its time has come. I also think that as a country, and at a time when we really need to be generating production in our local area, we must look to the resources we have. When we build with wood from the local area and use local contractors for its processing, we get a more sustainable construction process.

What is your view on modern wood construction?
– Wood offers a variety of possibilities in terms of design and architecture and provides a sense of well-being. Wood also gives a feeling of being close to nature, which I think most people crave even more in this digital age. Wood represents beauty, quality and permanence.

What role does culture have to play for the architect?
– As Minister for Culture, I want our parliamentary goals in architecture and design to promote a society with carefully designed and beautiful living environments, with state actors leading the way. This requires cooperation between all levels and sectors, both public and private. If we are to achieve quality that can also create value for the surrounding community and future generations, we need the expertise and drive to come from multiple levels and sectors.

How does architecture help us interpret the world around us?
– Every era has its own specific architectural expressions. In my view, a good living environment is carefully designed and bears witness to different times and stylistic eras, where modern and historic buildings can coexist in harmony and together form a vibrant place to be. Architecture carries the imprint of different styles that at best can give us an idea and sense of the passage of time. That's why I think it is so important that our environments contain both new and older buildings. Whatever is created becomes a document of its age, consciously and unconsciously, rooted in its time and left for posterity to interpret.

How can we ensure a good future for Sweden's architects?
– Things are tough right now across the construction industry, and of course Sweden's architects are not immune. Effort is required across a broad front to drive up construction activity, and in this pursuit different policy areas need to interact and complement each other's work. It is essential, not least, to get the construction of housing going again – both apartment blocks and houses – but also to find new ways to better utilise the existing stock by putting buildings to new uses, a task in which the architectural profession naturally has an important role to play.

– I believe it is important to strengthen the collaboration between culture and business, not least by spotlighting the policy for the designed living environment within the cultural and creative industries.

How can architecture help to reduce segregation?
– I would say that architecture is probably the art form that most people in society come into contact with. Consciously or unconsciously, the design of buildings and environments affects us on a human level. The rooms we spend time in, the buildings we see every day and the spaces we move around in affect how we perceive our living environment and thus also how we feel. We all have experiences and memories of buildings and places that have meant a lot to us, where the design and architecture have made us feel good.

– Architecture is an art form that can truly move us and provoke debate, as tastes and opinions differ. We all have experiences of places that make us feel involved, curious and inspired – that we like being in. And then, of course, the reverse, places and buildings that in their very nature can make us feel unsafe or indifferent. I believe a carefully designed environment, that makes the most of the qualities available, can help us feel a sense of pride and responsibility for the place, which in turn can contribute to a sense of community and inclusion.

Can architecture help build democracy?
– Yes! Enabling people to participate and engage in their living environment is a democratic issue. A carefully and universally designed built environment that is accessible to all its citizens – based on the knowledge that people are different and have different circumstances – can help to create a sense of belonging and thus help to build democracy. The national objective for the designed living environment, as set out by the Riksdag, states, among other things, that everyone should be given good opportunities to influence the development of their shared environment. Citizen participation is thus part of the goal, and that includes design in a broad sense.

Bengt-Göran Lindell

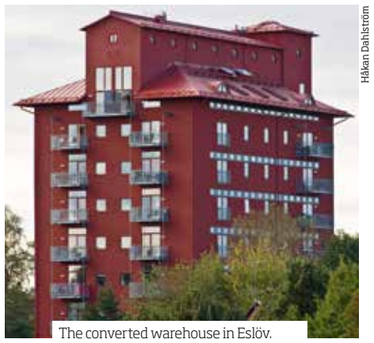
The old warehouse in Eslöv escaped demolition and is now a residential building, with the old structure preserved and exposed.

Legible history in preserved warehouse

Author Carl Jonas Love Almqvist wrote an acclaimed essay titled »The Significance of Swedish Poverty«, and nothing could better exemplify his much-quoted words than Gunnar Asplund's warehouse, which was born out of the hardships of the 1910s.

TEXT Stina Hagelqvist

THE STATE-OWNED GRAIN warehouses built in 1917–1919 can be seen as building on the crown and parish storehouses of earlier times, which were intended to provide for the population in the event of famine and war. In 1916, in the wake of the First World War, the National Warehouse and Cold Storage Board was set up to investigate the national supply situation and find solutions to poverty. Nine warehouses were soon completed across the country – all with exteriors by Gunnar Asplund and built with a mass timber frame based on drawings by concrete engineer and professor Carl Forsell at KTH Royal Institute of Technology.



Håkan Dahlström

The converted warehouse in Eslöv.

In this context, the timber structure trumped concrete because of the speed with which it could be erected, the lower cost and the ease with which the logs could be transported from northern Sweden by train directly to the construction sites in Tomelilla, Åstorp, Östra Klagstorp, Linköping, Eskilstuna, Roma, Hallsberg, Vara and Eslöv.

Of the nine, only two warehouses remain today, one in Vara and one in Eslöv, the latter of which has been converted into apartments. When the conversion was completed in 2008, it stood as Sweden's tallest wooden residential building. This warehouse was also in disrepair and at risk for a long time, but was saved from demolition thanks to the commitment of architect Curt Salomon-Sörensen. Several bodies had considered the possibility of preserving the building, but it was not seen as economically viable. The municipality had already granted a demolition permit when a new owner arrived who shared Salomon-Sörensen's vision of converting the building into housing, and so the municipality changed its mind and the building was saved. The redevelopment of the warehouse in Eslöv highlights the importance of commitment and economics.

SALOMON-SÖRENSEN, WHO HAD had a relationship with Asplund's buildings since childhood, felt a great sense of responsibility for the conversion. Although the building had stood empty since the early 1990s, with only damp and birds for company, the structure was in very good condition and the project »went like clockwork«, according to the architect. The original structure was solid, even oversized for its new purpose, the other design requirements were resolved and attention was paid to the requirement for a sympathetic design. The new detailed development plan required respect for the building's distinctive features, while also allowing for the original volume to be refined.

Permission was given for the outbuildings and added silos to be demolished, and the 1930s façade in fibre cement sheeting was replaced with a red-painted timber façade in keeping with the original. A new façade configuration was also superimposed onto the original design.

»I was strict with myself,« says Salomon-Sörensen about the treatment of the façade and Asplund's legacy.

THE NEW ITERATION of the old building is a fine example of how respect for the original can be combined with both new functions and new additions in the form of more and larger windows and balconies. Both the original and the additions are legible, forming two layers of time that each tell the story of the building.

In both cases, necessity and thrift can be said to have played a role. The volume with its distinctive roofline remains a landmark around Eslöv, reminding us of times when frugality was a virtue, but also that the fundamental principles laid out in Vitruvius' *Ten Books on Architecture* from around 80 BC still apply to this day. Beauty, utility and strength (or durability) are as fundamental now as they were then.

Stina Hagelqvist works as a conservation officer and architectural historian at Tyréns.

Erich G. Vallery, usda Forest Service - ses-4552, Bugwood.org

A blue-stained log. The picture clearly shows how the blue stain attacks the sapwood, but not the heartwood.

Mostphotos, Bilanol

Blue-stained timber is perfectly fine to use in structures that are not exposed to moisture, such as a timber frame.

Blue-stained wood at risk of being discarded unnecessarily

Blue-stained wood, with its characteristic blue grain, has become increasingly common as bark beetle infestations increasingly hit forests around the world. While often rejected by Swedish consumers, it is exported to other countries for use in their construction projects.

TEXT Johanna Lundeberg

A DARK BLUE discolouration is not always a reason to reject a board. If blue stain fungus is the cause, the material can still have a wide range of uses.

»There's a lack of knowledge to some extent. People think the wood is rotting and throw it away, even though blue stain doesn't affect strength, because the fungus doesn't attack the cell walls of the wood. But it's important for the construction industry to think more about resource efficiency and put all viable wood to the best use possible,« says Gabriel Eriksson, technical project manager at Swedish Wood.

He believes that the Swedish construction industry needs to be better at not wasting good raw materials unnecessarily and that there are uses even for the blue-striped timber.

»We're currently working on projects where we're looking at the possibilities of incorporating blue-stained timber into the innermost layers of CLT elements.«

BLUE-STAINED TIMBER SHOULDN'T be used in places where the wood may be exposed to moisture, such as in exterior cladding, windows and bargeboards, because the blue stain increases the permeability of the wood when exposed to water, which means that it absorbs water more easily. From an aesthetic point of view, it should also be borne in mind that the blue stain will show through if the wood is stained or painted.

But for internal, dry structures, such as stud walls, beams and roof trusses, blue-stained timber works just like any other timber, explains Anders Svensson, Quality Manager at the Vida sawmill group:

»Used correctly, it's not a problem, and if you have blue-stained timber in a stud wall, it has no effect on the final finish because wood panelling or plaster and wallpaper will be going on the outside, so no one will see it anyway.«

He feels the general perception of blue-stained wood means that it is not used in Sweden to the extent that it could be. However, many other markets don't see blue stain as a major problem, and Vida exports to the US, Australia and the UK, among others.

»We don't discard anything. We sort and sell to the accepting markets, and the global market price is unaffected.«

A distinction is commonly drawn between two types of blue stain, both caused by the blue stain fungus – sap staining and timberyard blue stain – depending on whether the staining occurs in the log or in the sawn timber. In a living and undamaged tree, the occurrence of blue stain is prevented by the limited availability of oxygen.

The blue stain fungus requires water and oxygen to grow, and the tree protects itself by keeping the bark sealed and the wood saturated with water. If, however, the tree suffers damage such that the sapwood begins to dry out and the structure opens up, the blue stain fungus can begin to get a foothold. To prevent the development of sap staining after harvesting, it is important to minimise the time between felling and the log being processed at the sawmill.

Spruce bark beetle attacks also cause blue stain. The damage they cause to the tree helps to dry out and open up the structure, allowing oxygen and moisture into the wood. The bark beetles can also spread spores and fungi to the tree, and the Swedish sawmill industry has seen an increased amount of blue-stained wood in recent years, as the insect's distribution has widened.

Timberyard blue stain, on the other hand, can occur after the log has been sawn, if the wood is left in a wet environment before it is dried. The staining often occurs during the period of general decay, from July into October.

»As with many other things, it grows more slowly when it's cold. During hot, humid August nights, blue stain can appear within a week, while later in the autumn when it's a little cooler, it may take a month,« says Anders Svensson.

ERICA BLOOM, MICROBIOLOGIST and senior researcher at RISE Research Institutes of Sweden, agrees that blue-stained wood is a material that could be used more widely in Sweden:

»There are questions that need to be answered, and as the climate changes, we'll face new challenges. I think it's important for the wood industry and researchers to work together to increase knowledge about the materials we surround ourselves with, so we make sure that we use the right material in the right place. Blue-stained timber has the same strength as any other. It's important to conserve natural resources, and the aim should always be to avoid discarding wood that can be used for other purposes.«

Wood with superficial or deep blue stain.

Blue stain and mould

Blue stain and mould can often – but not always – be the same species of fungus.

The availability of water is what determines whether the fungus grows as one or the other. The mould variant only grows on the surface and can take up water wherever it comes from, for example from the air or condensed on the surface.

But what determines whether it can grow into the material and take the form of blue stain is whether the wood has a sufficiently high moisture content. In other words, it is not enough for there to be moisture on the surface – for blue stain to occur, there also has to be water deeper in wood.

The angled monopitch roof softens the scale and allows the 11-metre-tall building to become part of its natural setting.

Volumes for shared living

Thanks to its geometric shape and grey finish, the 11-metre-tall holiday home, created for both social interaction and privacy, blends almost seamlessly into the countryside of southern Chile.

TEXT Johanna Lundeberg **PHOTO** Marcos Zegers och Iván Bravo

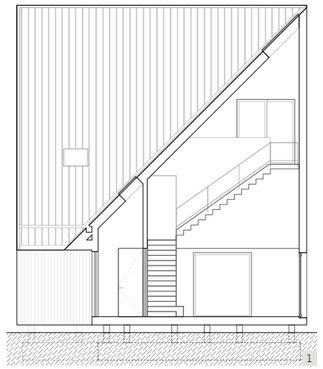
THE CHILEAN COUPLE had originally envisioned a single-storey house that would be connected to the adjacent lake. There was just one problem: the first time Iván Bravo, founder of Iván Bravo architects and the lead on the project, visited the site in Futrono, he could see neither the lake nor the view of the southern Chilean mountain peaks – the site had been left untouched for so long that the vegetation had completely taken over.

»The lake was only 20 metres away, but all the undergrowth made it impossible to find. We discovered a small stream that we were able to use as a reference point to locate the lake,« says Iván Bravo.

Following some thorough clearing work, the surrounding forest presented itself so beautifully that they wanted to keep it as untouched as possible. Trees and larger shrubs were left, and the lake was given a single access point from the house, where a path runs down to a nearby inlet that invites you to swim or sit and watch the wildlife.

»The client and her daughter fell in love with all the different birds and insects on the lake shore, so it was important to preserve as much as possible. Using the stream, we also created a little lagoon just below the house,« says Iván Bravo.

THIS WOULD ALSO influence the design of the building. With a single-storey building, they would have to open up more of the small forest they wanted to protect, to reveal the view of the lake. To keep the forest untouched while at the same time capturing the view, they instead built an 11-metre-tall house, shaped like a cube with two sides folded down to form an angled monopitch roof. The angle gives the building a triangular geometry from some sides, which also reduces the scale and allows it to more subtly rise up out of the landscape. Thanks to the grey-stained wood on the façade, the house now blends in beautifully with its surroundings, and on mornings that are heavy with mist, it forms an almost seamless transition between nature and architecture. »



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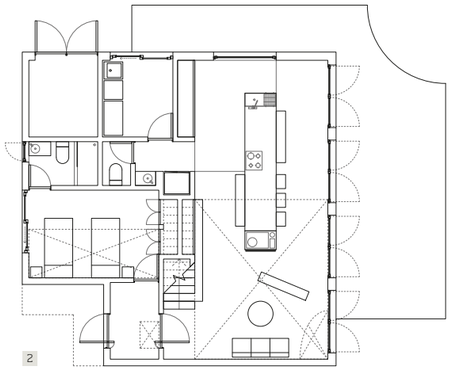

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» One of the two square façades faces the lake, with its many windows giving views of the lake and directing the gaze towards viewpoints further away on the horizon. The second square façade has 2.2-metre-high windows along the ground floor dining room but is otherwise closed. The other sides are even more closed, giving the building a protective feel while not letting in excessive heat during the summer months. But this also makes the management of light very important in the building, explains Iván Bravo:

»By not opening everything up, you can experience the world in different ways and follow the different times of the day by the light. On the open lower floor in particular, where we only have the long window at ground level supplemented by the light from the skylight three floors up, it's important to make the light work with the space.«

THE ARCHITECTURE IS based on two opposites: separate and shared. The clients had been together for many years and had chosen to live close to each other but in separate apartments in the capital Santiago. This holiday home was to be their first home together, and while they still wanted their own personal space, the shared area was important because they often have friends and their respective children visiting and want to be able to bring everyone together. One half of the house is therefore private, while the other half is for social interaction – and it is »

1. Cross-section.
2. Plan, ground floor.
3. Much of the vegetation has been saved, and adjacent to the house, the architects have formed a lagoon, from which the stream continues down to the lake 20 metres away.

One half of the interior is open all the way up to the roof ridge and houses the dining room and social spaces.

» open from the ground floor all the way up to the peak of the roof.

»The only place where you can experience the full height of 11 metres is in the living room and dining room, so basically half of the house is full height and the other half is divided into three floors, with a top floor that's double height,« says architect Martín Rojas.

A long table made from a fallen larch tree extends over almost the entire surface of the ground floor to accommodate many seated guests at once.

»Although they wanted a private part and a division between them, they kept coming back to the possibility of sharing, not only with each other but with their children and guests. And I think that influenced the design a lot; that they want to share their sociable moments with other people. Here you have the open and the public on the one hand, and the private on the other, but you also have an intimacy between the different parts,« explains Iván Bravo.

The two main bedrooms are upstairs, one for her, one for him and positioned opposite each other to provide a degree of closeness – a sense of being together without encroaching on each other's independence. The very top of the house opens up into a study, where the double height ceiling bears witness to both the geometry and the scale of the building. The triangular shape of the top helps not only to shrink the exterior impression of the house, but to create the intimate feeling that is so important in such a large house.

»On the top floor, there is a point where the ceiling is only 170 centimetres high, so you can touch it as you pass. Then you take a few steps out from the wall and it opens up to five metres again. This gives the house an inner balance, and it is precisely this possibility to compare larger and smaller spaces that creates the varying scale,« says Martín Rojas.

House Humo
FUTRONO, CHILE

ARCHITECT Ivan Brávo architects.
STRUCTURAL ENGINEER Pedro Bartolomé
AREA 185 sqm
COST EUR 300,000
w| ivanbravo.cl

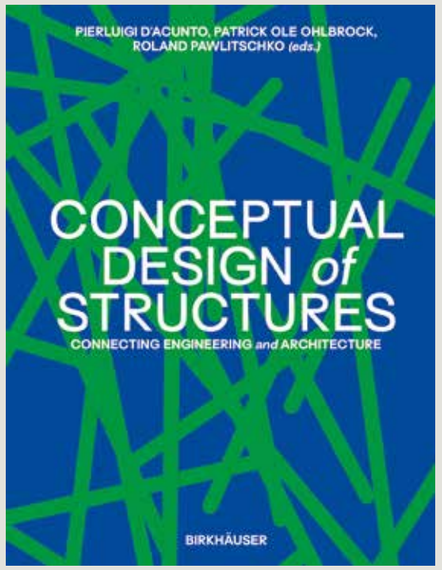
4. The house is shaped like two cubes with the roof on one side of each volume folded down. The triangular shape gives the house the variation that is so important in architecture.
5. The raw surface of the timber has been kept, with no further processing after sawing. The planks are stained grey to give a slightly worn look right from the start.

AS ONE OF the cheapest building materials in Chile, wood is widely used in buildings, and it was also the client's preference, mainly for the cost but also for aesthetic reasons.

»We haven't done much to the wood, other than sawing it to the right size. We kept the raw surface which we then stained plank by plank. We don't always use the stiff boards that come from the better parts of the trunk, because that's also more expensive. For façades we use the outer part of the trunk, which is cheaper because it's less useful for construction purposes,« says Martín Rojas.

The rugged feel is echoed in the interior, where the concrete floors contrast with the exposed wood on the walls. The slightly worn look was already there when the couple moved in and is fully intentional, explains Iván Bravo. People should be okay to walk in with dirty shoes and not feel like they are making a mess or getting the house dirty:

»We want our buildings to feel a little ... well, almost a little used, so they have their character right from the start. If it's all too immaculate and sophisticated, it quickly feels outdated and old in the wrong way. Our houses should be able to handle spontaneous living, homes should be soft and open to everyday life.«




Maxime Delvaux

The pavilion of Bahrain at Expo 2020 in Dubai. Drawn by architect Christian and structural engineer Joseph Schwartz

Conceptual Design of Structures – Connecting Engineering and Architecture
Pierluigi D'Acunto, Patrick Ole Ohlbrock, Roland Pawlitschko (redaktörer)
Birkhäuser (En)
978-3-0356-2795-4

Can most of the embodied energy be saved in the supporting structure? What influences the process of conceptual thinking? How do space and structure interact? How do architects and engineers collaborate? The book *Conceptual Design of Structures* seeks to answer these questions and many more by exploring the interface between structural engineering, architecture and art. The book attempts to answer the complex question of what needs to be considered when designing a structure, looking at the topic of multidisciplinary interrelationships in design and highlighting several different perspectives. Renowned practitioners and researchers from the fields of architecture and engineering share their insights, as do artists and historians who transcend disciplinary boundaries. In addition, this book provides a view on potential future developments and aspects of sustainable design and construction.

The contributions from several different disciplines, taking in research, academia and practice, create a holistic perspective. The contributions range from essays and interviews to project reviews where specific projects are examined with a focus on their use of technology, architecture and art.
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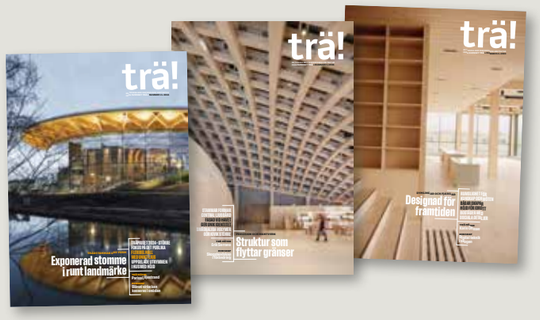

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